

HOW SHARING DIFFERENT TYPES OF MEMORIES AFFECTS  
RELATIONSHIP CLOSENESS: A CROSS-CULTURAL STUDY

A Thesis

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## **ABSTRACT**

Memory sharing has been frequently suggested to use for developing relationship closeness, especially autobiographical memory. The present study investigated whether sharing different types of memories, personal or vicarious, specific or generic, would have any difference in the effects on developing relationship closeness. In addition, the cultural effect, whether the subjects were Euro-Americans or Asians, are tested in the study. Participants (n=481) were presented with 10 scenarios of five types of conservation contents (conversations involving general personal memory, specific personal memory, general vicarious memory, specific vicarious memory, and non-person information) followed by several questions testing the degree of closeness to the hypothetical character in each scenario. This study provides evidence that the protagonist of memory influences the effect of developing closeness, and there is also an interaction between the specificity of memory and the identity of the protagonist in memory. Moreover, Asian participants are more likely than Euro-American participants to feel closer to people who shared the same memories. These findings substantiate the conceptual model of social function of autobiographical memory and contribute to understanding cultural impacts on the association between memory sharing and relationship closeness.

## **BIOGRAPHICAL SKETCH**

Li Guan received her B.A. in Communication from Shanghai Jiao Tong University, China and her B.S.(minor) in Psychology from East China Normal University, China in 2017. She had been to National University of Singapore for exchange program during her undergraduate. She has been working at Culture and Social Cognition Lab in the Department of Human Development at Cornell University from August, 2017. Her broad research interests lie at the intersection of social cognition, child development, and cultural impact.

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## TABLE OF CONTENTS

BIOGRAPHICAL SKETCH.....	iii
ACKNOWLEDGMENTS.....	iv
LIST OF FIGURES.....	vi
LIST OF TABLES.....	vii
INTRODUCTION.....	1
Social Functions of Autobiographical Memory .....	2
Importance of Generic Memory .....	5
Importance of Vicarious Memory .....	7
The Role of Culture.....	9
The Present Study.....	14
METHOD.....	16
Participants .....	16
Procedure.....	16
Measures.....	17
Closeness Index .....	17
Self-Construal Scale (SCS) .....	18
Flourishing Scale (FS).....	19
RESULTS .....	20
Overall effects of specificity and protagonist of memory .....	20
Cultural impact.....	22
DISCUSSION .....	26
Specificity of memory.....	26
Identity of protagonist in memory.....	27
Cultural impact.....	28
Limitations and future directions .....	30
REFERENCES .....	32
APPENDIX .....	41

## LIST OF FIGURES

- Figure 1.** Development of closeness in persons sharing different types of memories 22
- Figure 2.** Interaction between the effects of the protagonists of memory and cultures across specific and generic memory groups 25

## LIST OF TABLES

Table 1. Means and standard deviations of closeness development

23



## INTRODUCTION

As social beings, humans cannot form a society without developing relationships. Relationships are crucial to human development and existence, as humans often find themselves in the situations where challenges would be better solved collectively.

Relationship closeness, generally defined as what distinguishes among relationship categories (Aron, Aron, & Smollan, 1992), is also an important factor for adjustment and psychological well-being (Reis & Shaver, 1988). People have closer relationships with a romantic partner and core family members, looser relationships with a larger number of other friends and relatives, and even looser relationships with a mass number of acquaintances (Aron *et al.*, 1992). However, with the increasing importance given to the concept of relationship closeness in the literature, researchers not only try to explain the mechanism of how relationship closeness develops among humans but also generate more specific definitions and metrics. In particular, Berscheid, Snyder, and Omoto (1989) developed the Relationship Closeness Inventory (RCI), which attracted substantial attention. A few years later, Aron *et al.* (1992) further developed the definition of relationship closeness as one's sense of being interconnected with another.

Developing relationship closeness is a dynamic and complex process. Various channels have been suggested to develop closeness, such as emotional expression (Clark, Fitness, & Brissette, 2004), participating in the same events (Fraley & Aron, 2004), and remembering past memories (Alea & Bluck, 2007). Among all of the channels through which relationship closeness can be developed, remembering autobiographical memories has received much research attention. A body of research has shown relationship closeness can be developed or maintained by sharing

autobiographical memories (e.g., Nelson, 1993; Pillemer, 2003).

### **Social Functions of Autobiographical Memory**

Autobiographical memories refer to memories for specific episodes. It is becoming an increasingly interesting topic in memory literature as it is crucial in personal identity and psychological well-being. In fact, autobiographical memory has not been universally defined: according to Rubin (2006), it was defined as the storage of memories of events that have happened to a person. Rubin (2006) also mentioned the classification according to philosophical and behavioral considerations obtained by Brewer (1986, 1996), which includes two factors: 1) whether the memory recalled was a single or a repeated event, and 2) whether the person recalls this memory with an image involved in mind. When we say one recalled an *autobiographical memory*, an event happened at a single time is recalled with an image involved in mind.

The function of memory had been an area which was understudied years ago (Gigerenzer, 1997). Several decades earlier, researchers put an emphasis on how, how much, and how well humans remember the past (Bluck, Alea, Habermas, & Rubin, 2005). In the past two decades, researchers became increasingly interested in the functions of autobiographical memory. Before then, they only studied the contents, amount, and accuracy of autobiographical memory. Now, researchers conduct more studies of *why* humans remember the past personal experiences.

Though autobiographical memory serves several functions including self, social, and directive functions (e.g., Pillemer, 1992; Cohen, 1998; Bluck, 2003), the social function is considered by some researchers to be the most fundamental one (Nelson, 1993). For example, as

in Bluck and Alea's (2005) study, they stated the social functions (e.g., developing relationship) were more often used, whereas using autobiographical memory for the directive function (e.g., guiding future thinking and behaviors) had been "occasionally" reported.

The social functions of sharing one's autobiographical memories include strengthen social ties, express empathy, teach, communicate, or provide information (e.g., Alea & Bluck, 2003; Nelson, 1993; Pillemer, 1992). Meanwhile, the most elemental function is to use memories for maintaining and developing relationship closeness. Either thinking of memories by oneself, or sharing memories with others, can develop relationship closeness (Webster, 1995; Bluck & Alea, 2005). Thinking of memories involving a significant other, may enable the rememberer to keep the person who is recalled in mind, and in turn, increasing one's closeness to that person (e.g., Alea & Bluck, 2007; Kulkofsky, Wang, & Hou, 201).

But on most occasions, people use memories for interpersonal purposes (Nelson & Fivush, 2000). Though thinking of memories by oneself has the effect to develop closeness, it is less often used than sharing memories with others. Sharing memories with others provides new information of oneself to others, which leads others to have more and better knowledge of oneself (Rasmussen & Habermas, 2011). Hyman and Faries' (1992) studies also posited that using memories to converse with others is the most frequent reason for recalling or retelling memories. Sharing memories with others enables conversation partners to exchange thoughts, feelings, and needs with each other in a natural context. People can also express their sympathy and understanding during conversations, which is a process crucial for developing and deepening social bonds (Levinger, 1980; Wang, 2013). According to observational and self-report studies, there are

between 44 percent and 95 percent of conversations that involve the sharing of one or more autobiographical memories (Pasupathi & Carstensen, 2003; Beike, Brandon, & Cole, 2016). Sharing autobiographical memories enables one's conversations more effective and convincing, thus increasing the relationship closeness (Pillemer, 1992).

Alea & Bluck (2003) initiated a conceptual model of social functions of autobiographical memory, describing which factors affect the type of social function being served and the degree to which the function adapted. The components of this model consists of lifespan contextual influences, the qualitative characteristics of memory (the level of details and the amount of emotion involved), the speaker's features (e.g., age, gender, and personality), the familiarity and similarity of the listener to the speaker, how responsive the listener is during the process of memory sharing, and the feature of the social relationship in which the memory sharing occurs (valence and length of the relationship). Alea and Bluck (2007) examined whether the qualitative features of autobiographical memory (i.e., quality and content) influence the degree of the social function being served, especially the intimacy function. They indicated that how vivid and how significant the memory is, are very likely to affect the degree to which autobiographical memory serves useful social functions, and emotional re-experiencing during recalling process could also be relevant to autobiographical memory serving the function of developing relationship closeness.

In terms of the function of developing closeness, Bluck (2003) further indicated qualitative features of memories, such as amount of detail and emotion shared, can influence how well autobiographical memory serves this function. For example, sharing an emotional autobiographical memory may lead to increased closeness, while purely informative memory with

a number of details but little emotion may not lead to significantly increased closeness. As the only one component which can be changed in every single conversation by any conversation partner by one's own will, the qualitative characteristic is what we are most interested in in this section instead of other components which cannot be decided arbitrarily.

### **Importance of Generic Memory**

Extant research has generally focused on specific autobiographical memory. In contrast to autobiographical memory or episodic memory, there are memories for events that take place regularly during an extended period of time, namely, *generic memories*. A body of research make claims on whether the specificity of memories has an impact on social functions of memory. Some research claims that there are differences between memory for a more specific episode and memory for more generic information. The most important reason for us to bring the specificity of memory into the present study is that there is limited research discussing the association between the specificity of memory and relationship closeness development particularly, which could be essential to integrate the literature of the social functions of autobiographical memory and research on the intimacy function of self-disclosure.

According to Beike et al.'s (2016) study, more specific memory was defined as memory for a unique discrete episode, something that happened once at a specific time, lasting less than one day, involving certain amount of details and context, and a sense of mentally re-experiencing the event as well (Rubin, 2005; Tulving, 1997; Williams, Barnhofer, Crane, Herman, Watkins, & Dalgleish, 2007). For example, remembering an exciting moment watching the favorite idol

performing live and getting the idol's autograph would be a specific personal memory. The more generic memory often refers to the memory providing general information or conclusions, without providing any specific time whether such an event happens. For example, talking about one's own general likes and dislikes would be one's generic personal memory.

One study suggests the vivid details are one of the characteristics of a good memory story, memories with more vivid details are more likely to captivate and engage listeners (Baron & Bluck, 2009), thus could serve a better function for developing closeness. More studies even focus only on specific memory other than memory including both specific one and generic one. Cultural differences were only examined in the accessibility of specific past events recalled and the details of such specific events (Wang, 2009).

However, memories of past experiences are also reported to serve some purposes, such as for understanding the self, maintaining connections with significant others, healing emotional pains or learning valuable lessons, no matter they are generic or specific (Wang, Koh, Song, & Hou, 2015).

Most research which claims that the memory specificity has an impact on the extent to which the social function of memory serves is theoretical work. Nevertheless, a recent series of eight empirical studies with 1,271 participants, conducted by Beike *et al.* (2016), showed there was no significant difference between sharing general or specific memory on developing relationship closeness. They proved the development of relationship closeness during the process of sharing specific memories first. In one of their series of studies, the experimenters instructed half of the participants to converse specific memories and a half to converse generic memories with a

stranger, but they failed to reveal the stronger effect of sharing specific memories on feelings of closeness. In another study, participants took turns to answer questions in one condition intrigued specific memories while in the other condition evoked generic memories, but there was still no differential effect of sharing specific versus generic personal memories on developing the degree of feelings of closeness.

### **Importance of Vicarious Memory**

In spite of a larger amount of research on the specificity of memory, limited research studies how the protagonist in memory interacts with other factors. Most research focus on memories in which the rememberer self is the protagonist of the memory. However, besides having vivid and detailed memories of one's own personal experiences, people also have memories of events which happened to other people, including family members, friends, and colleagues, even famous celebrities or society at large (e.g., news events; Pillemer, Steiner, Kuwabara, Thomsen, & Svob, 2015; Wang, 2018).

Based on the concepts mentioned in Wang's (2018) research, here we arranged the identity of protagonists in memories into two categories. One is *personal memory*, which refers to the memory of the events which one personally experienced, namely, autobiographical memory; and the other is *vicarious memory*, which refers to the memory of the events experienced by others, instead of the speaker self.

Vicarious memory may be important for relationship due to the following reasons. First, vicarious memory has some features shared with personal memory. Specifically, vicarious and

personal memories have similarities, in terms of memory qualities (e.g., emotion, vividness experiencing the physical reaction; Pillemer *et al.*, 2015; Thomen & Pillemer, 2017). In Pillemer *et al.*'s (2015) study, participants even recall personal and vicarious memories with similar themes. More importantly, vicarious memory not only helps people solve life problems, impacts life decisions, but also serves the social function as maintaining and developing relationship closeness (Pillemer *et al.*, 2015; Thomen & Pillemer, 2017). So vicarious memories should be included as personal memories as well when we intend to study the association between memory sharing and closeness development. Second, although vicarious memory shares a similar overall pattern and serves several same functions with personal memory, it has been reported to be lower in some aspects, such as emotional intensity, vividness, and clarity. People also view personal memories as more positive and important than vicarious memories (Thomen & Pillemer, 2017). With regard to the effect of influencing relationships with others, vicarious memories are less effective than personal memories (Pillemer *et al.*, 2015). As a result of the possible differences between vicarious and personal memory, we would like to compare them in terms of their effects on closeness development.

Moreover, the functional significance of vicarious memory supports the idea that memory research should expand to include vicarious memory rather than only focusing on personal memory. A personal can learn from vicarious memories (Pillemer *et al.*, 2015). For instance, if a person has a vicarious memory that his colleague drove through a crowded street where he could only move ten feet every minute which made the colleague so annoyed, he probably would not drive through that way if he had another choice. Like this case, a person may learn not only from



one's personal experiences, but also learn from the events happened to others, thus changing one's attitudes or behaviors accordingly. Vicarious memories have also been frequently observed in family conversations (Wang, 2018), and have been reported to be held with strong personal and emotional commitment (Miller, 2009), thus contributing to the particular importance of vicarious memories. In addition, the present study is interested in vicarious memory, owing to the cultural difference discovered in this type of memories, which we will explain further in the next section.

### **The Role of Culture**

People with different perspectives and value for social relationships and memory sharing may develop different degrees of feelings of closeness to the same person in the same conversations. Culture might play a role in shaping the effect of memory sharing on developing closeness.

A body of research has suggested Westerners and Asians have different emphases on their relationships (e.g., Itoi, Ohbuchi, & Fukuno, 1996; Seepersad, Choi, & Shin, 2008). Some researchers argued that Asians have a great tendency to think of themselves as interdependent with close others, define themselves to a large extent by social networks and duties, and are more concerned about social harmony. In contrast, Westerners, particularly European Americans, have a greater tendency to think of themselves as independent of relationships and as autonomous or separated from others, and are concerned more with their own personal satisfaction (Itoi, Ohbuchi, & Fukuno, 1996; Cross, Bacon, & Morris, 2000). These findings are in line with Triandis' (1989) study in which he argued collectivists, such as Chinese have stronger motivation to maintain relationships, with stable close friends.

However, Goodwin (1999) pointed out that Westerners rely more heavily on romantic relationships and regard these relationships as a source of psychological intimacy, whereas collectivists, such as Koreans, have parents and siblings as other sources of intimacy. The similar conclusion is also found that relationships in Asian cultures are often achieved through kinship or other social hierarchical relations, and in turn, they are less voluntary and effortful to obtain close relationships, compared with Westerners (Hsu, 1953). An empirical study compared Americans with Koreans, in which Americans reported higher degrees of closeness in romantic relationships because of their stronger demands for romantic relationships (Seepersad, Choi, & Shin, 2008).

In a similar vein, significant differences in the association between styles of conversations and relationships have been reported between Americans and the Chinese (Chen, 1995). For example, Americans are more likely to think that speech is an effective way of communication that contributes to the relationship development, they regard speech as the main tool for exchanging personal experiences or thoughts and for the development of the interpersonal relationship, whereas Chinese don't value articulation and talkativeness through oral communication so much. Chen (1995) also finds out that Americans disclose more than Chinese, and this difference may be contributed to the consequence of culture values.

Autobiographical memory has been regarded as a product of cognition and an individual matter, and many theories of autobiographical memory mostly put an emphasis on the individual level and underestimate the impact of culture on the nature of autobiographical memory (Berntsen, & Rubin, 2004). But a large amount of recent research has revealed that culture has been instrumental in our understanding of autobiographical memory. Cultural differences have been

more and more frequently reported in research on the usage of autobiographical memory in recent years (e.g., Markus & Kitayama, 1991; Wang, 2004).

For the uses of memory, Westerners, especially European Americans, have distinct ways with Asians. In line with their different culture values, Westerners have been reported to often use memories to emphasize on the individual roles or their own perspectives, to build a unique identity whereas Asians use memory for these purposes less often (Wang, Koh, Song, & Hou, 2015). Westerners are more voluntary and effortful to obtain close relationships than Asians, they had a stronger desire and made an effort to develop their own social relations (Markus & Kitayama, 1991; Wang, 2004; Schug, Yuki, & Maddux, 2010). As a result, using memories for fostering or developing new relationships might be viewed more important among Westerners than among Asians.

Therefore, statements from the research with only Western sample reaching conclusions about the phenomenon or mechanism of human memory are likely subject to bias, especially when the functions of memories are used in different ways in different cultural groups (Alea & Wang, 2015).

In terms of the specificity of memory, European Americans showed the higher possibility to recall specific memories than Asians (e.g., Wang, 2006). When being asked to freely recall memories, European Americans tend to recall memories with particular time and place, focusing more on their own roles and autonomy while Taiwanese recalled more repeated everyday events and focused on the roles of others (Wang, 2006). Another study has also suggested Asians are usually unwilling to share emotional experiences, which are usually included in specific memories,

as their relationship concerns such as losing face or eliciting stress in others (Kim, Sherman, & Taylor, 2008).

With regard to the protagonist of memory, European Americans talk about personal memories more often than Asians while Asians talk about vicarious memories more often than European Americans (Wang, 2018). For example, in family conversations, European American mothers show lower tendency to talk about this type of memories, instead they put an emphasis on facilitating children's autonomy and individuality, as well as strengthening parent-child bonding (Wang, 2018), as European Americans often need to actively maintain and develop their relationships in their cultural context (Schug *et al.*, 2010). On the contrary, Asian mothers tend to talk about vicarious memories with their children, to facilitate interrelatedness and cultivate a sense of belonging and social harmony (Wang, 2018). Thus it is possible that Asians develop a higher degree of their closeness with the person who shares generic or vicarious memories whereas European Americans are likely to develop more closeness with the person who shares specific personal memories according to their recalling patterns.

Moreover, self-construals and psychological well-being, may be related to both cultural factor and development of relationship closeness (e.g., Tov & Diener, 2007; Markus & Kitayama, 2011, Wang, 2013). In terms of self-construals, which refers to how a person view, define and make the meaning of the self, whether the self is defined more independently of others or interdependently with others (e.g., Markus & Kitayama, 1991; Cross, Bacon, & Morris, 2000; Cross, Hardin, & Gercek-Swing, 2011). It has been generally divided into two types. One is *independent self-construal*, which refers to the construal of the self as fundamentally individual and separate from

others; the other is *interdependent self-construal*, which refers to the construal of the self as connected to others and defined by relationships with others (Markus & Kitayama, 2011). Westerners tend to obtain higher scores in independent self-construal, which means they are more likely to view themselves from the perspective of personal qualities and dispositions not related closely to others or social context, and they often wish to express the self. In contrast, people from East Asia tend to get higher scores for interdependent self-construal, which means they have an emphasis on social relationships and group memberships as well, they often wish to adjust themselves in a community, or to fit in well (e.g., Markus & Kitayama, 2011, Wang, 2013). As Markus and Kitayama (2011) stated in their study, self-construals may influence, even determine people's cognition, emotion, and motivation. Therefore, as a consequence of separate self-construal for people from different cultural groups, Asians seem to be more likely to attend to relationships, in turn, may develop higher degree of closeness with the person who shared the same memory than European Americans.

In terms of *psychological well-being*, which aims to know about people's assessments of their lives, including pleasant affect, infrequent unpleasant affect, and how satisfied they are with their life (Tov & Diener, 2007). There are some unique patterns of psychological well-being across cultural groups. For example, East Asians avoid extreme pleasant or unpleasant affect, instead, they desire to experience affect neither extreme pleasant nor unpleasant, but in the middle of pleasant and unpleasant affect; while European Americans prefer pleasant over unpleasant affect (Tov & Diener, 2007). There are a lot of factors contributing to the differences in psychological well-being across cultures, including the self and social relationships, thus we know that

relationships have certain correlation with psychological well-being here, which may influence the association between memory sharing and development of relationship closeness, which is our main focus in the present study. Thus we intended to control psychological well-being, as well as self-construals, holding them at a similar level, to justify the relationship between memory sharing, closeness development, and culture.

### **The Present Study**

In our present study, we intended to examine how the specificity of memory and the protagonist in the memory being shared influence the development of relationship closeness. Thus, the purpose of the present study is to investigate whether sharing different types of memories, such as generic personal memories, specific personal memories, general vicarious memories, and specific vicarious memories, have different effects on the degree to which relationship closeness being developed.

In terms of the effects of the specificity of memory, according to the findings in most literature, we proposed that sharing specific memories has a more significant effect than sharing generic memories on developing relationship closeness.

We involved both personal and vicarious memories in the present study to investigate if they are significantly different in the effects of developing relationship closeness between memories with different protagonists. In particular, we expected that sharing personal memories can develop relationship closeness to a higher degree than sharing vicarious memories.

Moreover, we would like to examine if the effects of sharing different types of memories

would differ across different cultural groups, especially for European American and Asian groups. This would be informative for the understanding of cultural influences on the social function of memory. We proposed that European Americans would be more positively affected by the sharing of specific or personal memories, while Asians perhaps would develop closeness to a higher degree with the sharing of generic or vicarious memories.

Self-construals (i.e., independent self-construal, interdependent self-construal) and psychological well-being have been reported to be relevant to both culture and relationships (e.g., Tov & Diener, 2007; Markus & Kitayama, 2011, Wang, 2013). Thus we included them as covariates in our present study.

## **METHOD**

The present study was designed for one between- and two within-subjects factors. The between-subject factor was cultural group (European Americans or Asians). The within-subject factors were the specificity of memory shared (general or specific) and the protagonist of memory shared (self or person not present in conversation).

### **Participants**

Data in this present study were collected from 481 participants recruited from Amazon Mechanical Turk. Participants included 266 European American or Europeans ( $M=32.74$  years,  $SD=11.46$ ), 141 Asians ( $M=29.70$  years,  $SD=6.90$ ), 38 African Americans ( $M=32.33$  years,  $SD=9.24$ ), 28 Latino or Hispanic ( $M=32.39$  years,  $SD=6.54$ ), and 8 Native Americans ( $M=31.01$  years,  $SD=7.97$ ). These participants consist of 270 male and 211 female. Data of 39 participants were eliminated due to too short completing time or not finishing the survey.

### **Procedure**

Participants took part in an online survey on Amazon Mechanical Turk. In the survey, we presented participants with ten hypothetical scenarios in which participants were instructed to imagine that they newly met a person and had a conversation with this person, then participants were presented with part of the conversation content in the scenario. Five different types of conversation content made up these ten scenarios, including two specific personal memories (e.g., an exciting moment when I watched my idol performing live), two generic personal memories



(e.g., my regular work), two specific vicarious memories (e.g., my classmate spending time with my family on Easter), two generic vicarious memories (e.g., my classmate's education history), and two control questions for non-person information type, in which the information doesn't pertain to a person (e.g., technology news). We then asked them to rate, taking the perspective of a conversation partner with the character in the scenario, their feelings of closeness to the character through four questions for each scenario. In the later part of the survey, participants were also asked to fill the Self-Construal Scale, the Flourishing Scale, and some individual demographic questions, including gender, age, ethnicity, and education status.

## **Measures**

### ***Closeness Index***

We used the Inclusion of Other in Self Scale (IOS; Aron et al., 1992) for our main measurement of degree of closeness. The IOS Scale is a one-item pictorial measure intended to directly measure people's sense of interpersonal interconnectedness. In the IOS Scale, subjects choose one of the seven Venn-like diagrams, each showing different degrees of overlap between two circles labeled "Self" and "Other." The IOS has good test-retest reliability and predictive validity, and is a valid measure of closeness of intimate partners as well as strangers (Aron et al., 1992).

Following by the IOS Scale, we used the item "How likely would you be to use the term "we" to characterize you and your conversation partner?" with responses ranging from 1 (not at all) to 7 (extremely; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997). Next was the Subjective

Closeness Index (Berscheid, Snyder, & Omoto, 1989), consist of two questions “Relative to all your other relationships (both same and opposite sex), how would you characterize your relationship with your conversation partner?” and “Relative to what you know about other people’s close relationships, how would you characterize your relationship with your conversation partner?” with responses ranging from 1 (not at all close) to 7 (extremely close; Fraley and Aron, 2004). Cronbach’s alphas indicate that the four questions used for estimating to which degree the closeness between the subjects and hypothetical character has been developed have very good internal consistency, ranging from .941 to .960. Thus, we averaged four scores to represent the closeness degree developed for each scenario.

### ***Self-Construal Scale (SCS)***

In the present study, we used the Self-Construal Scale developed by Singelis (1994). Here self-construal refers to a group of thoughts, feelings, and acts regarding one’s relationship to others, and the self as differentiated from others. Two subscales (independent self-construal scale and interdependent self-construal scale) make up the Self-Construal Scale. For each subscale, there are 15 items, each item is presented with responses ranging from 1 (strongly disagree) to 7 (strongly agree). In independent self-construal subscale, sample items include, “I enjoy being unique and different from others in many respects” and “I prefer to be direct and forthright when dealing with people I’ve just met.” In interdependent self-construal subscale, sample items include, “I often have the feeling that my relationships with others are more important than my own accomplishments” and “Even when I strongly disagree with group members, I avoid an argument.”

The total score for each subscale ranges from 15 (Strong Disagreement with all items) to 105 (Strong Agreement with all items).

### ***Flourishing Scale (FS)***

There are eight statements describing various aspects of human functioning ranging from positive relationships to feelings of competence, to having meaning and purpose in life. The Flourishing Scale is aimed to test participants' psychological well-being. Sample items include, "I am competent and capable in the activities that are important to me" and "My social relationships are supportive and rewarding." Each item of the Flourishing Scale is scored on a Likert-type scale ranging from 1 to 7 from Strong Disagreement to Strong Agreement. All items are phrased in a positive direction. The total scores can range from 8 (Strong Disagreement with all items) to 56 (Strong Agreement with all items). High scores represent that the subjects view themselves in positive terms in important areas of functioning. The scale provides an overview of positive functioning across various domains which are generally believed to be important for humans' psychological well-being. The Flourishing Scale is shown in the Appendix.

## RESULTS

### Overall effects of specificity and protagonist of memory

We ran a Repeated Measures ANCOVA on the degree of closeness with all the types of memories being shared (i.e., generic personal memory, generic vicarious memory, specific personal memory, specific vicarious memory, and non-person information), controlling for independent self-construal, interdependent self-construal, and psychological well-being ( $M_s = 77.11, 71.35, 44.10$ ). The ANCOVA showed a significant main effect of the type of memory,  $F(4, 474) = 4.98, p = .001, \eta_p^2 = .04$ . Bonferroni-adjusted pairwise comparison showed that the effect of sharing non-person information ( $M = 2.98, SD = 1.73$ ) on developing closeness is significantly weaker than all other four groups (i.e., generic personal memory,  $M = 3.62, SD = 1.55$ ; generic vicarious memory,  $M = 3.60, SD = 1.53$ ; specific personal memory,  $M = 3.80, SD = 1.57$ ; specific vicarious memory,  $M = 3.50, SD = 1.64$ ),  $p_s < .001$ . The effect of sharing specific personal memory on developing closeness is stronger than all other four groups,  $p_s < .001$ . Thus, sharing memories, personal as well as vicarious, specific as well as generic, can remarkably lead to higher degree of closeness than sharing non-person information (e.g., technology news).

To further examine the interaction between the specificity and the protagonist of memory, we excluded the data of non-person information type. A 2 (specificity: specific vs. generic) x 2 (protagonist: personal vs. vicarious) Repeated Measures ANCOVA was conducted on the development of closeness.

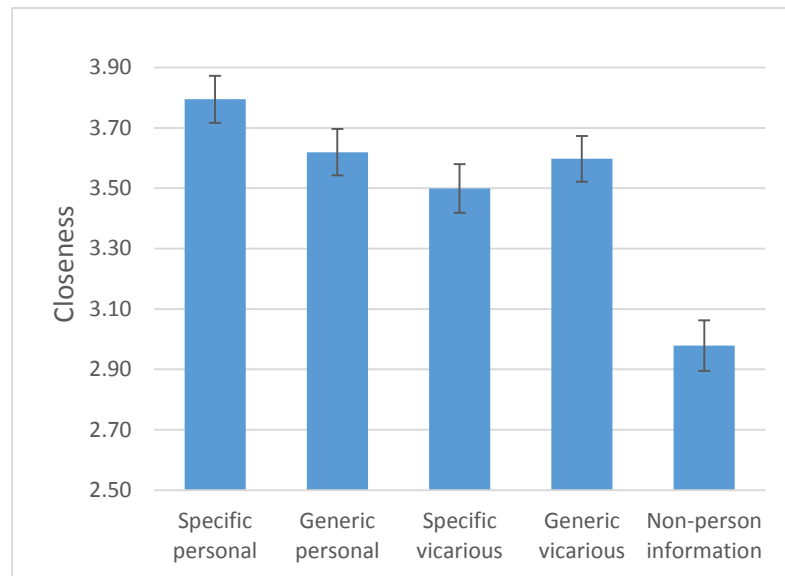
The ANCOVA showed a main effect of the protagonist of memory was also found,  $F(1, 477) = 25.88, p < .001, \eta_p^2 = .05$ . Personal memories have a stronger effect to develop closeness,

specific as well as generic, than vicarious memories. This main effect was also qualified by the interaction between the protagonist and the specificity of memory,  $F(1, 477) = 24.47, p < .001, \eta_p^2 = .05$ . Due to the discovery of an interaction between the effects of the specificity of memory and the protagonist of memory on developing closeness, we investigated the effects of sharing memories within the generic memory group and the specific memory group, respectively. The ANCOVA showed a simple main effect of the protagonist of memory within the specific memory group,  $F(1, 477) = 41.69, p < .001, \eta_p^2 = .08$ , but not within the generic memory group,  $F(1, 477) = .35, p = .555, \eta_p^2 < .01$ . Respondents expressed higher degree of closeness to the conversation partner after having been shared with specific autobiographical memories ( $M = 3.80, SD = 1.57$ ) than having been shared with specific vicarious memories ( $M = 3.62, SD = 1.55$ ),  $p < .001, 95\% CI = [.21, .39]$ . But there is no significant difference between the closeness developed by the sharing of personal memories ( $M = 3.50, SD = 1.64$ ) and the sharing of vicarious memories ( $M = 3.60, SD = 1.53$ ),  $p = .555, 95\% CI = [-.05, .09]$ .

We also investigated the effect of sharing memories within the personal memory group and the vicarious memory group, separately. In both cases, a simple main effect of the specificity of memory was discovered:  $F(1, 477) = 27.23, p < .001, \eta_p^2 = .05$ , within the personal memory group; a simple main effect of the specificity of memory was found,  $F(1, 477) = 4.95, p = .025, \eta_p^2 = .01$ , within the vicarious memory group. However, sharing personal memory ( $M = 3.80, SD = 1.57$ ) had a significantly stronger effect than sharing vicarious memory ( $M = 3.48, SD = 1.63$ ) on developing closeness under specific memory condition,  $p < .001, 95\% CI = [.11, .24]$ , whereas sharing personal memory ( $M = 3.60, SD = 1.53$ ) had a significantly weaker effect than sharing

vicarious memory ( $M = 3.62$ ,  $SD = 1.64$ ) on developing closeness under generic memory condition,  $p = .025$ ,  $95\% CI = [-.18, -.01]$ .

Figure 1 shows the overall effects of sharing five different types of memories on relationship closeness development. The error bars represent the standard errors of the estimates.



**Fig 1.** Development of closeness in persons sharing different types of memories

### **Cultural impact**

In order to demonstrate the effect of sharing memories on developing relationship closeness across different cultures, the data were analyzed using a 2 (culture: European American vs. Asian) x 2 (specificity: specific vs. generic) x 2 (protagonist: personal vs. vicarious) mixed ANCOVA, with specificity and protagonist of memory being two within-subjects factors and culture being one between-subjects factor. The data of African American participants ( $n = 38$ ), Latino or Hispanic participants ( $n = 28$ ), and Native American participants ( $n = 8$ ) are not sufficient to well present the population in their cultures, thus we excluded them from analyses involving culture

as a factor and only included European Americans (n = 266) and Asians (n = 141) in our sample.

The degrees of closeness developed by different types of memories across cultural groups are summarized in the following table.

Table 1. Means and standard deviations of closeness development

Specificity	All participants		European Americans		Asians	
	Mean	SD	Mean	SD	Mean	SD
Generic						
Personal memory	3.62	1.55	3.02	1.39	4.67	1.23
Vicarious memory	3.60	1.53	3.07	1.40	4.58	1.23
Specific						
Personal memory	3.80	1.57	3.29	1.50	4.73	1.27
Vicarious memory	3.50	1.64	2.89	1.46	4.59	1.32
Non-person information	2.98	1.73	2.31	1.39	4.08	1.67

After controlling for independent self-construal, interdependent self-construal, and psychological well-being ( $M_s = 76.51, 70.85, 43.89$ ), the mixed ANCOVA showed a main effect of culture,  $F(1, 402) = 66.24, p < .001, \eta_p^2 = .14$ . Asian participants ( $M = 4.33, SD = 1.19$ ) were more likely than European American participants ( $M = 3.20, SD = 1.36$ ) to develop higher degree of relationship closeness to the person sharing whatever type of memory,  $p < .001, 95\% CI = [.83, 1.36]$ . This main effect was qualified by the three-way interaction among the respondents' cultural group, the specificity of memory and the protagonist of memory,  $F(1, 402) = 9.23, p = .003, \eta_p^2 = .02$ .

Due to the discovery of a three-way interaction, we ran a 2 (protagonist) x 2 (culture) mixed ANCOVA to further examine the two-way interaction between these two factors within specific

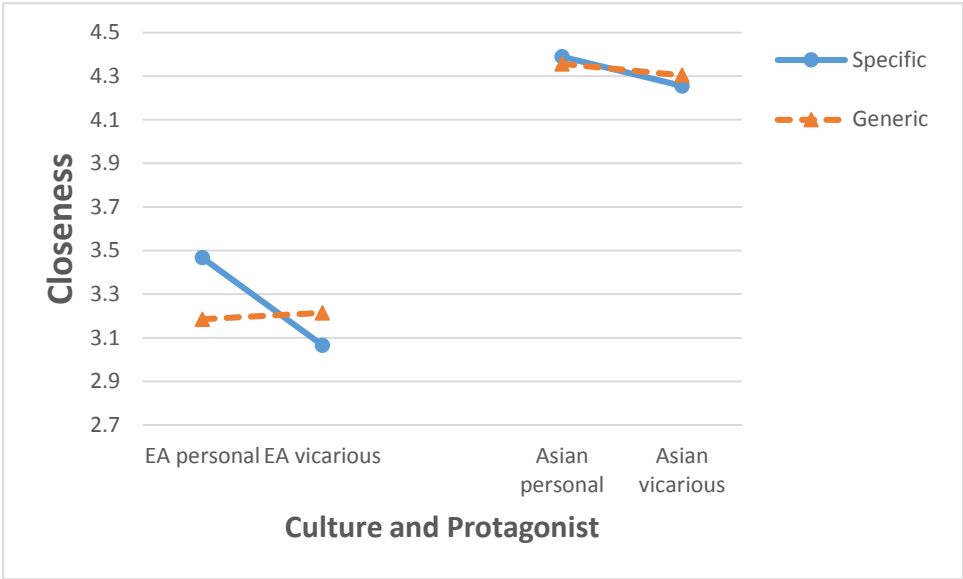
memory group and generic memory group, respectively.

Within the specific memory group, a main effect of culture was discovered,  $F(1, 402) = 56.86$ ,  $p < .001$ ,  $\eta_p^2 = .12$ , which was qualified by the interaction between the protagonist of memory and culture,  $F(1, 402) = 6.07$ ,  $p = .014$ ,  $\eta_p^2 = .02$ . For both personal and vicarious memory condition, Asians ( $M_s = 4.40, 4.26$ ) developed higher degrees of closeness than European Americans ( $M_s = 3.47, 3.07$ ). For Asian participants, they developed the degrees of closeness to a similar level regardless the memories shared with them were personal memories ( $M = 4.40, SD = 1.27$ ) or vicarious memories ( $M = 4.26, SD = 1.32$ ),  $F(1, 402) = 2.13$ ,  $p = .145$ ,  $\eta_p^2 < .01$ . But for European Americans, they developed a higher degree of closeness to the person who shared personal memories ( $M = 3.47, SD = 1.50$ ) than who shared vicarious memories ( $M = 3.07, SD = 1.46$ ),  $F(1, 402) = 38.31$ ,  $p < .001$ ,  $\eta_p^2 = .09$ .

Within the generic memory group, there is no significant interaction found between the protagonist of memory and culture,  $F(1, 402) = .73$ ,  $p = .392$ ,  $\eta_p^2 < .01$ . A main effect of the culture was found,  $F(1, 402) = 67.98$ ,  $p < .001$ ,  $\eta_p^2 = .15$ , but not for the protagonist of memory,  $F(1, 402) = .08$ ,  $p = .779$ ,  $\eta_p^2 < .01$ . Asians ( $M = 4.33, SD = 1.23$ ) generally developed higher degrees of closeness to the person who shared memories with them than European Americans ( $M = 3.20, SD = 1.40$ ),  $p < .001$ , 95% CI = [1.32, 1.84].

Figure 2 demonstrates the difference in the interaction between the effects of the protagonist of memory and the specificity of memory on developing closeness across different cultural groups.





**Fig 2.** Interaction between the effects of the protagonists of memory and cultures across specific and generic memory groups

## DISCUSSION

In this work, we explored the effects of sharing memories with different protagonists or specificity on developing relationship closeness between newly met people. Our results showed difference in developing closeness between different levels of specificity of memories under conditions with different protagonists of memories. Meanwhile, we also discovered the cultural effects of sharing memories on developing closeness. We explain the results in more detail, respectively, in the following sections.

Compared with non-person information, sharing specific memories or general memories can both significantly improve one's closeness with the conversation partner, which is consistent with prior research. Sharing autobiographical memories serves social functions, which include developing closeness (Alea & Bluck, 2007). The distinct finding in our study is that memories other than autobiographical memories (i.e., memories focusing on a third person other than the conversation partners) may also serve the social function of developing relationship closeness, as long as the memories involve a particular person.

### **Specificity of memory**

According to our overall results, sharing memories does increase the feelings of closeness between conversation partners. However, there was no significant difference found between the effects of sharing general or specific memories. Either general memories or specific memories may improve the relationship closeness to a similar level. A body of research has suggested that the specificity of the memory shared is important. For instance, Baron and Bluck (2009) state that

memories with vivid details are more likely to engage and attract listeners, and Alea and Bluck (2003) find that memories with different levels of detail or amount of emotion may lead to different responses or different feelings of closeness. However, our results were more in line with Beike *et al.*'s (2016) empirical studies, in which they also reported no significant difference between more specific personal memories and more generic personal memories.

However, within European American group, under personal memory condition in particular, sharing specific memories serves a stronger effect in developing closeness than sharing generic memories, while the results show an opposite pattern under vicarious memory condition.

### **Identity of protagonist in memory**

Overall, we found that different protagonists of memories could lead to different levels of relationship closeness. Previous studies only focus on discussing the impact of the specificity of memories, but rarely mention the protagonist of memories.

In the present study, the results suggest that the protagonist of memories had an influence on the closeness development. Telling personal memories, whether specific or general, had a stronger impact on developing relationship closeness than telling memories which were only related to persons other than both conversation partners. This is perhaps because sharing memories related to oneself may provide more new information and better knowledge of oneself to the conversation partner (Rasmussen & Habermas, 2011). In the current study, the participants were instructed to imagine they met a newly known person, instead of a close friend or a significant other, in which situations they might have the assumption that they knew little about each other, at least were not

familiar with the person, so they might be interested in obtaining more knowledge about the person him or herself, instead of a person other than themselves. Therefore, sharing one's personal memories, whether general or specific ones, would be a good strategy to immediately develop relationship closeness between people with loose relationships.

More importantly, an interaction between the specificity of memory and the protagonist of memory was discovered in the present study. The main effect of the specificity of memory hasn't occurred in a body of previous research and our present research as well, nevertheless, the interaction revealed that the sharing of more specific memories significantly increased the relationship closeness between the listener and the person who shared memories when the memories were also personal memories. Nevertheless, the effect of sharing of specific memories was sharply impaired when the memories were vicarious.

### **Cultural impact**

More importantly, this current study intended to draw attention to the cultural effect on the association between memory sharing and the development of relationship closeness.

First, we discovered significant differences in the overall degrees of closeness developed by memory sharing between European Americans and Asians. To every scenario containing memory sharing content, Asian participants rated much higher degrees of closeness to the character in the scenario than European American participants, no matter which type of memories was involved. This could probably be led by the different emphases on relationships of people from different cultural contexts. Asians have been frequently reported to be more interconnected with other

people than European Americans, while European Americans usually view themselves as independent of relationships and as autonomous or separated from others (Itoi, Ohbuchi, & Fukuno, 1996; Cross, Bacon, & Morris, 2000), hence it would be easier for Asians to feel closer to a speaker who shared his or her own memories in conversations where one does not engage the other conversation partner in conversations.

Second, though the interaction between the protagonist of memory and the specificity of memory was found in both cultural groups (i.e., European Americans and Asians), the main effect of the protagonist of memory was only found within Asian group but not within European American group. It means that sharing specific personal memories would be the most effective way to develop relationship closeness between two newly met people when compared with the sharing of other types of memories which we mentioned in the present study. However, sharing generic personal memories might be the second effective way to develop relationship closeness only for Asians, but not for European Americans. Moreover, for people from both cultural groups, besides sharing non-person information, the sharing of specific vicarious memories is the least powerful way to develop closeness.

This finding lends support to the findings of previous studies on the cultural differences in different views of the usage of memories and the relationships. Asians are more likely to have a small group of close friends since they are in the cultural context where relationships are more stable and they are less available to reach new partners, while European Americans tend to develop a large number of new relationships (Markus & Kitayama, 1991; Wang, 2004; Schug, Yuki, & Maddux, 2010). Therefore, sharing memories in which involve more people (i.e., the

protagonist of memory is a person other than the speaker) may have a stronger effect on developing closeness among people who are from a cultural context where developing new relationships with more people is more highly valued, namely, European Americans.

### **Limitations and future directions**

Several limitations of the present study are noteworthy. One primary limitation of the present study is the bias which may be led by the self-report assessment. The accuracy and validity of such reports require that participants must be fully aware of the content of those scenarios. Tests through scenario reading may exclude the facial expressions and tone changing which are all crucial in real conversations, thus making the interactions less self-involved.

Another limitation is the experimental materials, particularly the pre-written scenarios we used might not be perfectly controlled for their amount of detail or their level of emotional content. We lack evidence to further interpret the mechanism of different effects of sharing different types of memories on the closeness development. The reasons for differences may include the level of detail, which can influence how vivid the memory stories are and how much information the memories can offer, and emotional content, which includes the emotional intensity and positivity of the memories.

Further research may improve the present study by improving the scenarios to control the amount of detail and the amount of emotional content more precisely, or even explore these research questions with lab-setting methods, enabling participants to converse in a more natural context. Moreover, the effects of sharing memories may differ across people who met each other

for first time and friends with extant close relationships. The difference between people with different extant relationships may further explain the mechanism of the social function of memory.

In general, our research provides a deeper insight into the effects of sharing memories. Especially, this is the only empirical study which investigates the role of the protagonist of memories in development of relationship closeness. Meanwhile, we included the cultural factor in our study, which enables this study to lay the groundwork for future research into the cultural impact on memory sharing and relationship closeness, making findings more generalizable to people across various cultural groups.

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## APPENDIX

**Imagine this is the first time you meet Tina and you have a short conversation with her. In your conversation, Tina shares the following information:**

I love to be outdoors whenever I'm not working or in school. My favorite place to be is the Buffalo River. In the summer and spring I enjoy kayaking and in the fall and winter seasons, I love to go hiking. I try to get out there as much as possible.

I work at Bank of the Ozarks. I've worked there for about a month now and I enjoy the atmosphere. It's very laid back and I am able to work on my homework when we do not have customers. I also work with some great people who help me when I'm unsure of what I'm doing.

My 21<sup>st</sup> birthday was so much fun. A bunch of my friends from my hometown came to Fayetteville and took me out to Dickson. I wore a "21 and hot, buy me a shot" sash and a birthday crown. I had a blast with them going to Powerhouse for dinner and then a bunch of bars following.

I saw my favorite artist, Sheryl Crow, at Memphis in May this past year. She had such a great stage presence and it was truly a dream come true to finally see her perform live. She played all of my favorite songs and then some. I kept on jumping up and down until she finally looked at me.

I have five nieces and nephews. Their names are Matti, Joshua, Joseph, Maddox, and Jake. I love being with them as much as possible because before you know it, they're grown up. I don't get to see them as often as I would like, so I try to call or FaceTime them once a week.

Ada is one of my best friends, she was my classmate during high school time. She is good at language learning and has a pretty good memory. She has studied German since she was six years old. After high school graduation, she enrolled in University of Arizona, majoring German Studies. She sometimes tells me about her school life now.

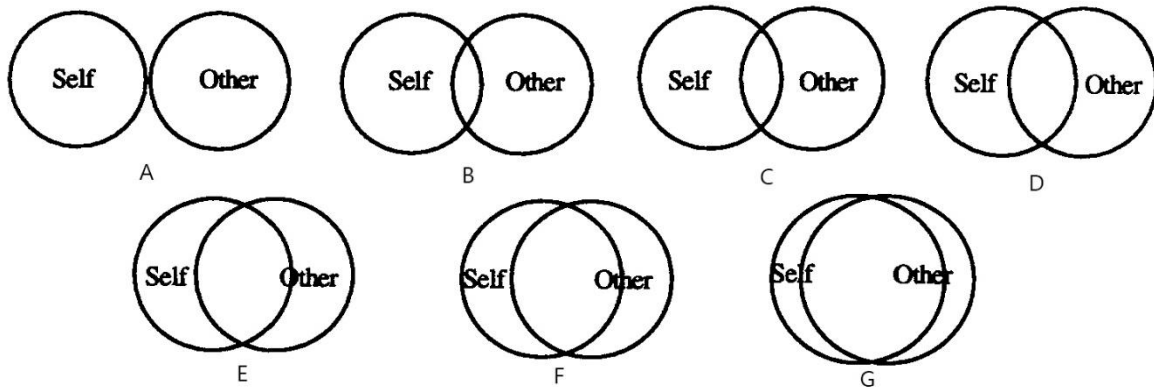
The freshman year of college, my roommate went to my hometown, Mountain Home, with me for Easter. She was from Serbia, so she was not able to go home for the holiday. She felt welcomed when my family cooked a huge brunch for her and even getting her an Easter basket of her own.

My niece and I went out for snow cones last week. She has two brothers, so she likes to feel special and be given a girl day every now and then. She went to the park and then to the swimming area with me together. She loved having the one on one time with me.

New York City has a humid subtropical climate, with cold winters and hot, moist summers. Snow is common in winter, but the amount varies, and winter rain is common. The best time to travel to New York is in autumn, when temperatures are mild, days are sunny and humidity not too high.

The iPhone 8 is released on September 22, 2017. The overall design is the same as the design of the previous-generation devices, but one of the big upgrades Apple has given its new iPhone, and the focus of the design, is the glass rear. Its inclusion means a brand-new feature in the shape of wireless charging.

Q1 Choose the letter from the picture below that best describes the relationship between the two of you after that conversation.



Q2 How likely would you be to use the term “we” to characterize you and Tina?

1 not at all	2	3	4	5	6	7 extremely
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Q3 Relative to all **your** other relationships (both same and opposite sex), how would you characterize your relationship with Tina?

1 not at all close	2	3	4	5	6	7 extremely close
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Q4 Relative to what you know about **other people’s** close relationships, how would you characterize your relationship with Tina?

1 not at all close	2	3	4	5	6	7 extremely close
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### Self-Constraint Scale

This is a questionnaire that measures a variety of feelings and behaviors in various situations. Listed below are a number of statements. Read each one as if it referred to you. Beside each statement write the number that best matches your agreement or disagreement. Please respond to every statement. Thank you.

1=STRONGLY DISAGREE

4=DON'T AGREE OR

5=AGREE SOMEWHAT

2=DISAGREE

DISAGREE

6=AGREE

3=SOMEWHAT DISAGREE

7=STRONGLY AGREE

- \_\_\_1. I enjoy being unique and different from others in many respects.
- \_\_\_2. I feel comfortable using someone's first name soon after I meet them, even when they are much older than I am.
- \_\_\_3. Even when I strongly disagree with group members, I avoid an argument.
- \_\_\_4. I have respect for the authority figures with whom I interact.
- \_\_\_5. I do my own thing, regardless of what others think.
- \_\_\_6. I respect people who are modest about themselves.
- \_\_\_7. I feel it is important for me to act as an independent person.
- \_\_\_8. I will sacrifice my self interest for the benefit of the group I am in.
- \_\_\_9. I'd rather say "No" directly, than risk being misunderstood.
- \_\_\_10. Having a lively imagination is important to me.
- \_\_\_11. I should take into consideration my parents' advice when making education/career plans.
- \_\_\_12. I feel my fate is intertwined with the fate of those around me.

- \_\_\_13. I prefer to be direct and forthright when dealing with people I've just met.
- \_\_\_14. I feel good when I cooperate with others.
- \_\_\_15. I am comfortable with being singled out for praise or rewards.
- \_\_\_16. If my brother or sister fails, I feel responsible.
- \_\_\_17. I often have the feeling that my relationships with others are more important than my own accomplishments.
- \_\_\_18. Speaking up during a class (or a meeting) is not a problem for me.
- \_\_\_19. I would offer my seat in a bus to my professor (or my boss).
- \_\_\_20. I act the same way no matter who I am with.
- \_\_\_21. My happiness depends on the happiness of those around me.
- \_\_\_22. I value being in good health above everything.
- \_\_\_23. I will stay in a group if they need me, even when I am not happy with the group.
- \_\_\_24. I try to do what is best for me, regardless of how that might affect others.
- \_\_\_25. Being able to take care of myself is a primary concern for me.
- \_\_\_26. It is important to me to respect decisions made by the group.
- \_\_\_27. My personal identity, independent of others, is very important to me.
- \_\_\_28. It is important for me to maintain harmony within my group.
- \_\_\_29. I act the same way at home that I do at school.
- \_\_\_30. I usually go along with what others want to do, even when I would rather do something different.

## Flourishing Scale

Below are eight statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

1=STRONGLY DISAGREE

4=DON'T AGREE OR

5=AGREE SOMEWHAT

2=DISAGREE

DISAGREE

6=AGREE

3=SOMEWHAT DISAGREE

7=STRONGLY AGREE

1. \_\_\_\_\_ I lead a purposeful and meaningful life.
2. \_\_\_\_\_ My social relationships are supportive and rewarding.
3. \_\_\_\_\_ I am engaged and interested in my daily activities.
4. \_\_\_\_\_ I actively contribute to the happiness and well-being of others.
5. \_\_\_\_\_ I am competent and capable in the activities that are important to me.
6. \_\_\_\_\_ I am a good person and live a good life.
7. \_\_\_\_\_ I am optimistic about my future.
8. \_\_\_\_\_ People respect me.